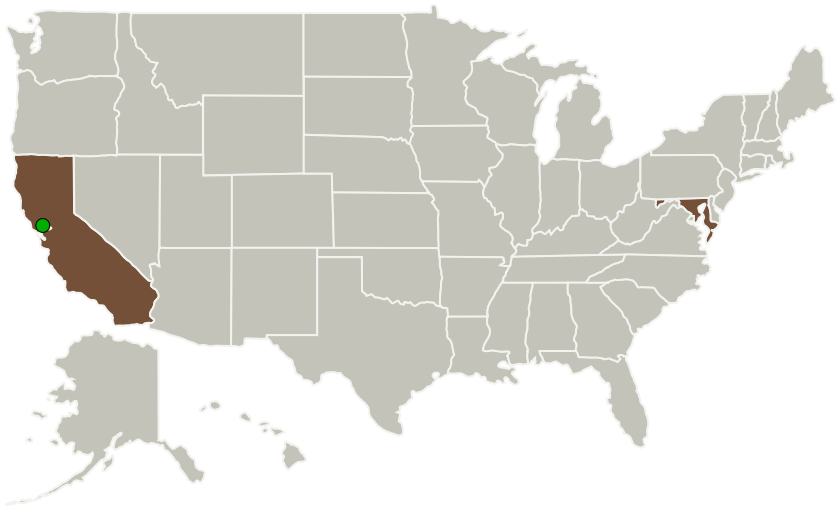
The Design and Optimization of an Integrated Arrival/Departure Scheduler, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Intelligent Automation, Inc. (IAI) proposes the design and validation of a dynamic integrated arrival/departure scheduler. In contrast to current approaches, we propose changing arrival and departure runway assignments dynamically based upon the traffic situation, weather conditions, surface congestion, and planned departure pushbacks as well as planned arrivals flowing into the terminal area from the enroute centers. Testing of the concept will be done in a virtual software environment, first using an analytic environment and later with humans-in-the-loop (controllers and pilots). When complete, this project has the potential to provide (1) a strategy to handle the FAA's Best-Equipped Best-Served concept at airports, (2) a significant increase in Metroplex capacity without building additional runways and (3) support for a new aviation business model in which flights are scheduled to Metroplexes rather than specific airports. To accomplish these goals, this effort will develop a controller that dynamically assigns arrival and departure slots available at a given runway based on the valuation of an "integrated capacity utilization metric." The metric will be a function of arrival/departure demand, arrival queue lengths at fixes and surface departure queues. The result is a more efficient use of airport resources than provided by currently available controllers.

Primary U.S. Work Locations and Key Partners



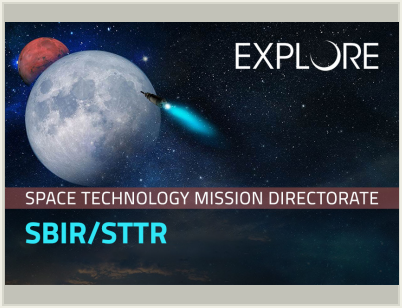


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Intelligent Automation, Inc.	Lead Organization	Industry	Rockville, Maryland
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Maryland

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Summary: THE DESIGN AND OPTIMIZATION OF AN INTEGRATED AR RIVAL/DEPARTURE SCHEDULER, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/140858)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Intelligent Automation, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

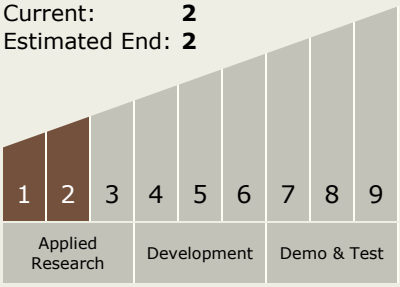
Carlos Torrez

Principal Investigator:

Frederick Wieland

Technology Maturity (TRL)

Start: **1**
Current: **2**
Estimated End: **2**



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Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
  - TX16.3 Traffic Management Concepts

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System